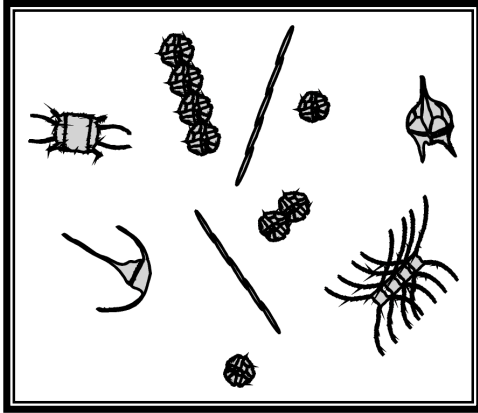


# BIOTOXIN QUARTERLY REPORT

## July-September 1999



### PHYTOPLANKTON MONITORING:

#### ***Pseudo-nitzschia* Bloom Declines, *Alexandrium* Appears**

The enclosed reports (No. 99-19, 99-21, 99-23) show the distribution of toxigenic phytoplankton for the months of July through September, 1999. The following sections summarize the observations of phytoplankton distribution and abundance throughout this time.

**July** – Following several months in which *Pseudo-nitzschia* was abundant along most of the Southern California coast, this diatom finally decreased by the beginning of July. Although *Pseudo-nitzschia* remained common at several locations, its numbers were greatly reduced from previous months.

Significant levels of *Alexandrium* were observed for the first time during the latter part of July. Low to moderate relative abundances were detected along the coast of Marin County in Drakes Bay and along the San Francisco coast, just inside the Golden Gate. In addition, a small number of *Alexandrium* cells was also detected

inside San Diego Bay on July 4.

In general, diatom species dominated the phytoplankton communities along the northern California coast during July. *Chaetoceros* and *Thalassiosira* were the most commonly observed species. *Skeletonema* was abundant in a sample collected offshore of the Marin coast. Despite the dominance of diatoms, a bloom of the dinoflagellate *Gymnodinium splendens* was detected inside Tomales Bay. Along the Santa Cruz shoreline inside Monterey Bay a more diverse assemblage of diatoms and dinoflagellates was observed. The dinoflagellate species of *Dinophysis*, *Prorocentrum*, and *Scrippsiella* were common, particularly towards the end of July.

Samples and volunteer observations along most of the southern California coast showed a mix of diatoms and dinoflagellates throughout the month.

In addition to the diatoms mentioned previously, the dinoflagellates *Prorocentrum* and *Ceratium* were common from Santa Barbara through San Diego. *Gonyaulax polyedra* was also common at sites along the coasts of Los Angeles and San Diego.

**August** – *Alexandrium* was observed in samples from Del Norte, Humboldt, Marin, San Francisco, and Santa Barbara counties during August. The greatest numbers of this dinoflagellate were observed at sites along the Marin and San Francisco coast. PSP toxicity was also detected at these locations, as discussed below.

The domoic acid-producing diatom *Pseudo-nitzschia* was observed along most of the California coast, with greatest numbers observed at sites between Santa Barbara and San Diego.

Much as in July the phytoplankton communities observed along the northern California coast were dominated by diatoms during August. The most common species were *Chaetoceros*, *Thalassiosira*, *Melosira*, and *Skeletonema*. It is interesting to note that *Alexandrium*, and the resultant PSP toxicity in shellfish, was observed at several locations despite the general abundance of several diatom species. Dinoflagellates such as *Gymnodinium* and *Prorocentrum* were common inside Monterey Bay.

As observed in July, the southern California sites contained a more diverse mix of diatoms and

### How to Contact Us:

*The Biotoxin Monthly Report is prepared and distributed by the California Department of Health Services' Marine Biotoxin Monitoring and Control Program.*

*For information on our program please call (510) 540-3423, fax us at (510) 540-2716, or send me an email at [glangloi@ix.netcom.com](mailto:glangloi@ix.netcom.com).*

*Call our toll-free number for recorded information on shellfish quarantines related to marine biotoxins: (800) 553-4133.*

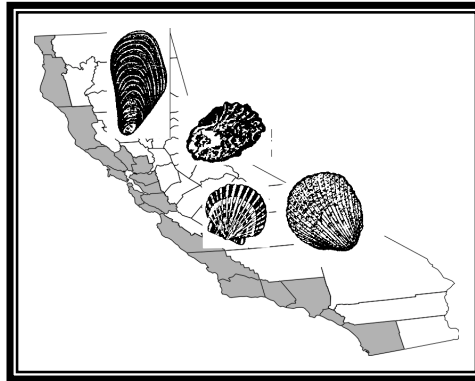
(Continued on page 2)

dinoflagellates. The dinoflagellate species of *Prorocentrum*, *Gonyaulax*, and *Ceratium* were abundant at all sites from Los Angeles through San Diego, although *Pseudo-nitzschia* was also abundant at several San Diego sites during the month.

**September** – *Alexandrium* continued to be present at the same locations in San Francisco and Marin where it was observed in August. In addition, samples from our volunteers in Monterey and Sonoma also contained cells of this dinoflagellate. There were no sightings of *Alexandrium* south of Monterey during September.

The overall distribution and abundance of *Pseudo-nitzschia* declined along most of the California coast. The one exception was Santa Barbara, where this diatom was initially abundant during the beginning of the month.

As for other species of phytoplankton along the coast, the dominance of diatoms in previous months continued in the northernmost counties. Along the coast of Marin the diatoms gave way to *Gymnodinium* by the second week of the month, particularly inside Drakes Estero. This dinoflagellate was replaced by the diatoms *Melosira* and *Thalassionema* but reoccurred during the third week of the month before giving way to a diverse assemblage of diatoms by the end of the month. A similar oscillating pattern between diatoms and dinoflagellates was also observed along the coast of Santa Barbara County. The dominant dinoflagellates included *Gonyaulax polyedra*, *Gymnodinium splendens*, *Prorocentrum micans*, and *Ceratium spp.* Several sites along the San Diego coast were dominated by these same dinoflagellates.



### **SHELLFISH MONITORING: PSP Toxins Detected**

The enclosed reports (No. 99-18, 99-20, 99-22) show the distribution of PSP toxins for the months of July through September, 1999. The following sections summarize the results of all toxin analyses during this period.

**July** - The paralytic shellfish poisoning (PSP) toxins were detected in northern California for the first time all year during the latter half of July. The increase in dinoflagellates at the end of June signaled the possibility of *Alexandrium* appearing. By July 13 we detected a low concentration of toxins in mussels from our sentinel buoy in the main channel of Drakes Estero. By the following week we were seeing low levels of toxins farther inside Drakes Estero. In addition to the low level toxicity observed in side the Estero throughout the rest of the month, a low level of toxins was detected across Drakes Bay at the Chimney Rock sentinel mussel station on July 27.

**August** – The low levels of PSP toxicity detected in July continued through the first week of August. By the second week the toxin concentrations had increased above

alert levels inside Drakes Estero. The maximum detected concentration was 580 ug in sentinel mussels from Drakes Estero.

**September** – High levels of PSP toxins persisted inside Drakes Estero throughout the month. The maximum concentration detected was 750 ug. In addition, toxin concentrations above the alert level were detected at several other sites along the Marin coast as well as at Pescadero State Beach (San Mateo).

### **Quarantines**

The annual quarantine on sport-harvested mussels occurs each year from May 1 through midnight on October 31. This quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. This particular species is known to concentrate and retain the PSP toxins for a long period of time. By discarding the dark part of the siphon and the viscera the consumer can reduce the risk of ingesting these toxins. Persons taking any clams or scallops are advised to remove and discard the dark parts (i.e., the digestive organs or viscera), which are more likely to contain toxins than the white tissue.

We also advise that persons engaged in the sport-harvesting of any bivalve shellfish should contact our "Shellfish Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity.

**Table 1.** California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during July 1999.

COUNTY	AGENCY	SAMPLES
<b>Del Norte</b>	Del Norte County Health Department	1
<b>Humboldt</b>	Coast Seafood Company	4
	Humboldt County Environmental Health Department	2
<b>Mendocino</b>	None Submitted	
<b>Sonoma</b>	None Submitted	
<b>Marin</b>	Bay Bottom Beds, Inc.	1
	Cove Mussel Company	3
	California State University Monterey Bay	5
	CDHS Environmental Management Branch	2
	Hog Island Oyster Company	5
	Johnson Oyster Company	20
<b>San Francisco</b>	San Francisco County Health Department	1
<b>San Mateo</b>	San Mateo County Environmental Health Department	1
	California State University Monterey Bay	1
<b>Santa Cruz</b>	Santa Cruz County Environmental Health Department	1
<b>Monterey</b>	California State University Monterey Bay	6
<b>San Luis Obispo</b>	Williams Shellfish Company	5
	San Luis Obispo County Environmental Health Department	2
<b>Santa Barbara</b>	U.C. Santa Barbara Marine Science Institute	4
	Vandenberg Air Force Base, Environmental Health Services	1
<b>Ventura</b>	Ventura County Environmental Health Department	2
<b>Los Angeles</b>	Los Angeles County Health Department	3
	Southern California Marine Institute, Fish Harbor Lab	1
<b>Orange</b>	Orange County Health Care Agency	1
	Ecomar, Inc.	3
<b>San Diego</b>	Carlsbad Aquafarms, Inc.	4

**Table 2.** Agencies and organizations participating in marine phytoplankton sample collection in California during July 1999.

COUNTY	AGENCY	SAMPLES
<b>Del Norte</b>	Crescent Coastal Research	1
<b>Humboldt</b>	Coast Seafood Company	4
	Humboldt State University Marine Lab	3
<b>Mendocino</b>	California Department of Parks and Recreation	1
	CDHS Volunteer (John Richardson)	3
<b>Sonoma</b>	Bodega Marine Lab	3
<b>Marin</b>	CDHS Volunteer (Brent Anderson)	4
	California Department of Fish and Game	1
	CDHS Environmental Management Branch	4
	Johnson Oyster Company	20
	Hog Island Oyster Company	1
	Tomales Bay Association	5
<b>Alameda</b>	CDHS Volunteer (Maya McCoy)	1
<b>San Francisco</b>	CDHS Volunteer (Eugenia McNaughton)	4
<b>San Mateo</b>	None Submitted	
<b>Santa Cruz</b>	O'Neill Yacht Charters	2
	California Department of Parks and Recreation	1
<b>Monterey</b>	None Submitted	
<b>San Luis Obispo</b>	Morro Bay 4-H	1
<b>Santa Barbara</b>	California Department of Parks and Recreation	2
	Vandenberg Air Force Base, Environmental Health Services	1
	U.C. Santa Barbara Marine Sciences	3
<b>Ventura</b>	California Department of Parks and Recreation	1
<b>Los Angeles</b>	Southern California Marine Institute, Fish Harbor Lab	3
	Los Angeles County Sanitation District	3
	Los Angeles County Health Department	2
<b>Orange</b>	CDHS Volunteer (Jeff Kermode)	1
	Orange County Sanitation District	1
	Orange County Marine Institute	1
	Ecomar, Inc.	1
<b>San Diego</b>	CDHS Volunteers (Paul Sims, Randy and Bill Dick, Kai Schumann, Jeff Kermode, Vicki Ganguli)	11
	San Diego County Environmental Health	5

**Table 3.** California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during August 1999.

COUNTY	AGENCY	SAMPLES
<b>Del Norte</b>	Del Norte County Health Department	2
<b>Humboldt</b>	Coast Seafood Company	5
<b>Mendocino</b>	CDHS Volunteer (Amy Johnson)	1
<b>Sonoma</b>	None Submitted	
<b>Marin</b>	Cove Mussel Company	3
	California State University Monterey Bay	4
	CDHS Environmental Management Branch	2
	Hog Island Oyster Company	7
	Johnson Oyster Company	35
	Point Reyes Oyster Company	3
<b>San Francisco</b>	San Francisco County Health Department	2
<b>San Mateo</b>	San Mateo County Environmental Health Department	1
	California State University Monterey Bay	3
<b>Santa Cruz</b>	None Submitted	
<b>Monterey</b>	California State University Monterey Bay	5
<b>San Luis Obispo</b>	Williams Shellfish Company	5
	San Luis Obispo County Environmental Health Department	2
<b>Santa Barbara</b>	U.C. Santa Barbara Marine Science Institute	4
	Vandenberg Air Force Base, Environmental Health Services	1
<b>Ventura</b>	None Submitted	
<b>Los Angeles</b>	Los Angeles County Health Department	1
	Southern California Marine Institute, Fish Harbor Lab	1
<b>Orange</b>	Orange County Health Care Agency	1
	Ecomar, Inc.	5
<b>San Diego</b>	Carlsbad Aquafarms, Inc.	3

**Table 4.** Agencies and organizations participating in marine phytoplankton sample collection in California during August 1999.

COUNTY	AGENCY	SAMPLES
<b>Del Norte</b>	Crescent Coastal Research	2
<b>Humboldt</b>	Coast Seafood Company	5
	Humboldt State University Marine Lab	2
<b>Mendocino</b>	California Department of Parks and Recreation	3
	CDHS Volunteer (John Richardson)	5
<b>Sonoma</b>	Bodega Marine Lab	3
<b>Marin</b>	CDHS Volunteer (Brent Anderson)	4
	CDHS Environmental Management Branch	1
	Johnson Oyster Company	24
	Hog Island Oyster Company	1
<b>Alameda</b>	None Submitted	
<b>San Francisco</b>	CDHS Volunteer (Eugenia McNaughton)	5
	Gulf of the Farallones National Marine Sanctuary	1
<b>San Mateo</b>	None Submitted	
<b>Santa Cruz</b>	O'Neill Yacht Charters	1
	California Department of Parks and Recreation	2
	Aptos High School	1
	Pacific Cetacean Group	1
	San Lorenzo Valley High School	2
<b>Monterey</b>	CDHS Volunteer (Lisa Marrack)	3
<b>San Luis Obispo</b>	Morro Bay 4-H	1
	Port San Luis Marine Institute	2
	San Luis Obispo County Environmental Health Department	1
	Tenera Environmental	4
<b>Santa Barbara</b>	California Department of Parks and Recreation	3
	Vandenberg Air Force Base, Environmental Health Services	1
	U.C. Santa Barbara Marine Sciences	4
<b>Ventura</b>	California Department of Parks and Recreation	2
<b>Los Angeles</b>	Southern California Marine Institute, Fish Harbor Lab	3
	Los Angeles County Sanitation District	1
	Hyperion Treatment District	3
<b>Orange</b>	Orange County Sanitation District	2
	Orange County Marine Institute	1
	Ecomar, Inc.	2
<b>San Diego</b>	CDHS Volunteers (Paul Sims, Randy and Bill Dick, Kai	17

	Schumann, Jeff Kermode, Vicki Ganguli)	
	San Diego County Environmental Health Department	7

**Table 5.** California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during September 1999.

COUNTY	AGENCY	SAMPLES
<b>Del Norte</b>	Del Norte County Health Department	2
<b>Humboldt</b>	Coast Seafood Company	4
<b>Mendocino</b>	None Submitted	
<b>Sonoma</b>	None Submitted	
<b>Marin</b>	Cove Mussel Company	4
	California State University Monterey Bay	3
	CDHS Environmental Management Branch	1
	Hog Island Oyster Company	4
	Johnson Oyster Company	25
	Marin Oyster Company	1
	Point Reyes Oyster Company	1
<b>San Francisco</b>	San Francisco County Health Department	2
<b>San Mateo</b>	San Mateo County Environmental Health Department	1
	California State University Monterey Bay	2
<b>Santa Cruz</b>	None Submitted	
<b>Monterey</b>	California State University Monterey Bay	4
<b>San Luis Obispo</b>	Williams Shellfish Company	3
	San Luis Obispo County Environmental Health Department	1
	CDHS Environmental Management Branch	1
<b>Santa Barbara</b>	U.C. Santa Barbara Marine Science Institute	7
	Vandenberg Air Force Base, Environmental Health Services	1
	California Department of Parks and Recreation	1
<b>Ventura</b>	Ventura County Environmental Health Department	1
<b>Los Angeles</b>	Los Angeles County Health Department	1
	Southern California Marine Institute, Fish Harbor Lab	1
<b>Orange</b>	Ecomar, Inc.	4
<b>San Diego</b>	Carlsbad Aquafarms, Inc.	6
	San Diego County Environmental Health Department	1



**Table 6.** Agencies and organizations participating in marine phytoplankton sample collection in California during September 1999.

COUNTY	AGENCY	SAMPLES
<b>Del Norte</b>	Crescent Coastal Research	1
<b>Humboldt</b>	Coast Seafood Company	3
	Humboldt State University Marine Lab	2
<b>Mendocino</b>	CDHS Volunteer (John Richardson)	5
<b>Sonoma</b>	Bodega Marine Lab	4
<b>Marin</b>	CDHS Volunteer (Brent Anderson)	4
	CDHS Environmental Management Branch	1
	Johnson Oyster Company	24
<b>Alameda</b>	CDHS Environmental Management Branch	1
<b>San Francisco</b>	CDHS Volunteer (Eugenia McNaughton)	4
<b>San Mateo</b>	None Submitted	
<b>Santa Cruz</b>	Aptos High School	2
	California Department of Parks and Recreation	2
	Santa Cruz Environmental Health Department	3
<b>Monterey</b>	CDHS Volunteer (Lisa Marrack)	2
<b>San Luis Obispo</b>	Morro Bay 4-H	1
	Port San Luis Marine Institute	2
	San Luis Obispo County Environmental Health Department	1
	Tenera Environmental	3
	CDHS Environmental Management Branch	3
<b>Santa Barbara</b>	California Department of Parks and Recreation	4
	Vandenberg Air Force Base, Environmental Health Services	1
	U.C. Santa Barbara Marine Sciences	7
	CDHS Environmental Management Branch	1
<b>Ventura</b>	California Department of Parks and Recreation	1
<b>Los Angeles</b>	Southern California Marine Institute, Fish Harbor Lab	3
	Los Angeles County Sanitation District	3
	Los Angeles County Environmental Health Department	1
<b>Orange</b>	Orange County Sanitation District	2
	Orange County Marine Institute	2
	Ecomar, Inc.	1
<b>San Diego</b>	CDHS Volunteers (Paul Sims, Randy and Bill Dick, Kai Schumann, Jeff Kermode, Vicki Ganguli, Rachel Woodfield)	15
	San Diego County Environmental Health Department	3

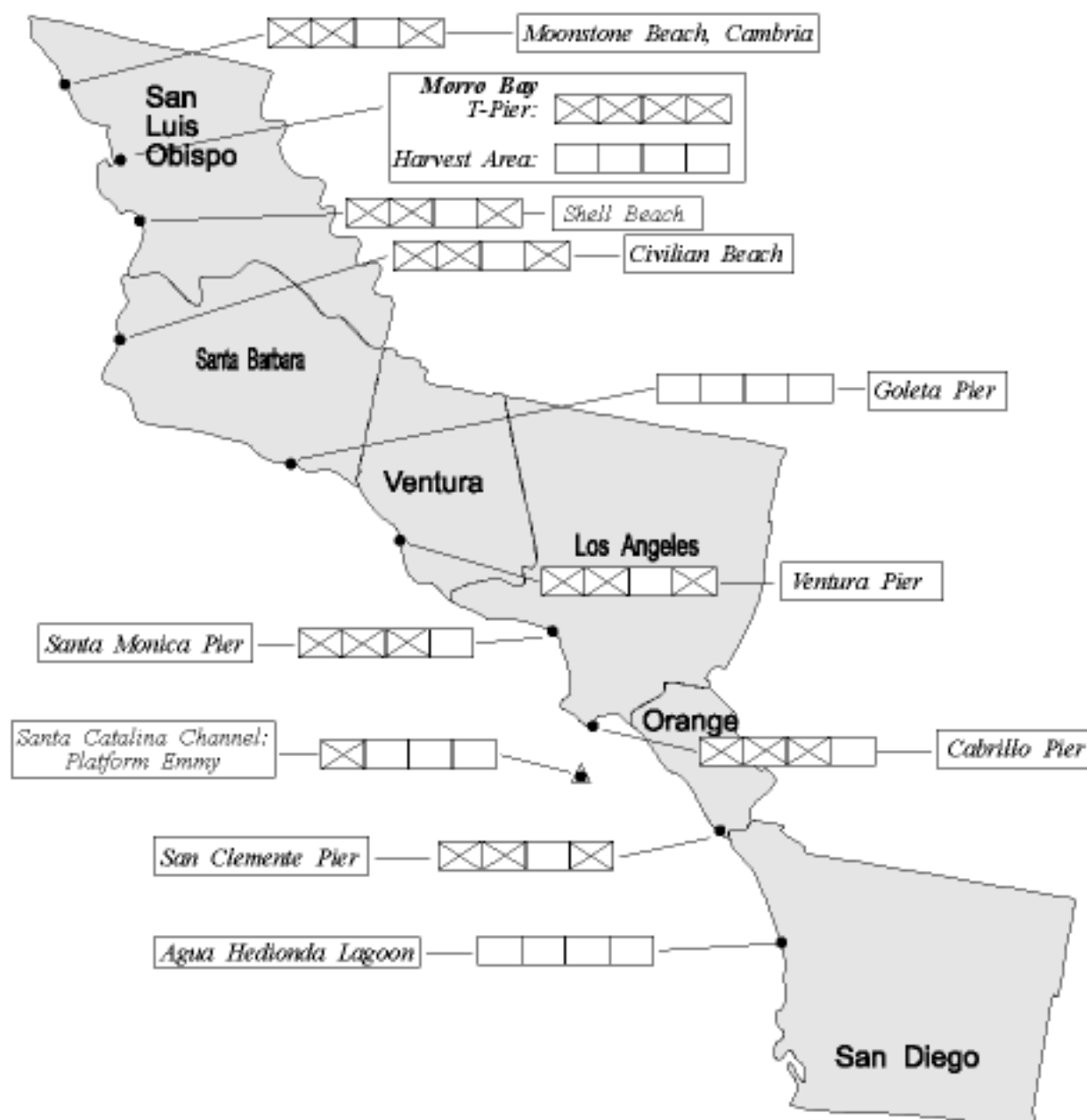
# SHELLFISH BIOTOXIN MONTHLY REPORT

July 1999

Technical Report No. 99-18

## Distribution of Shellfish Biotoxins

### Southern California



#### KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g)

DA Range: (ppm)

<sup>1</sup>PSP Alert Level <sup>2</sup>DA Alert Level  
● = Single Site ● = Multiple Sites ▲ = Offshore Site

Source: DHS Marine Biotoxin Monitoring and Control Program, July 1999.

## INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

### Southern California Summary:

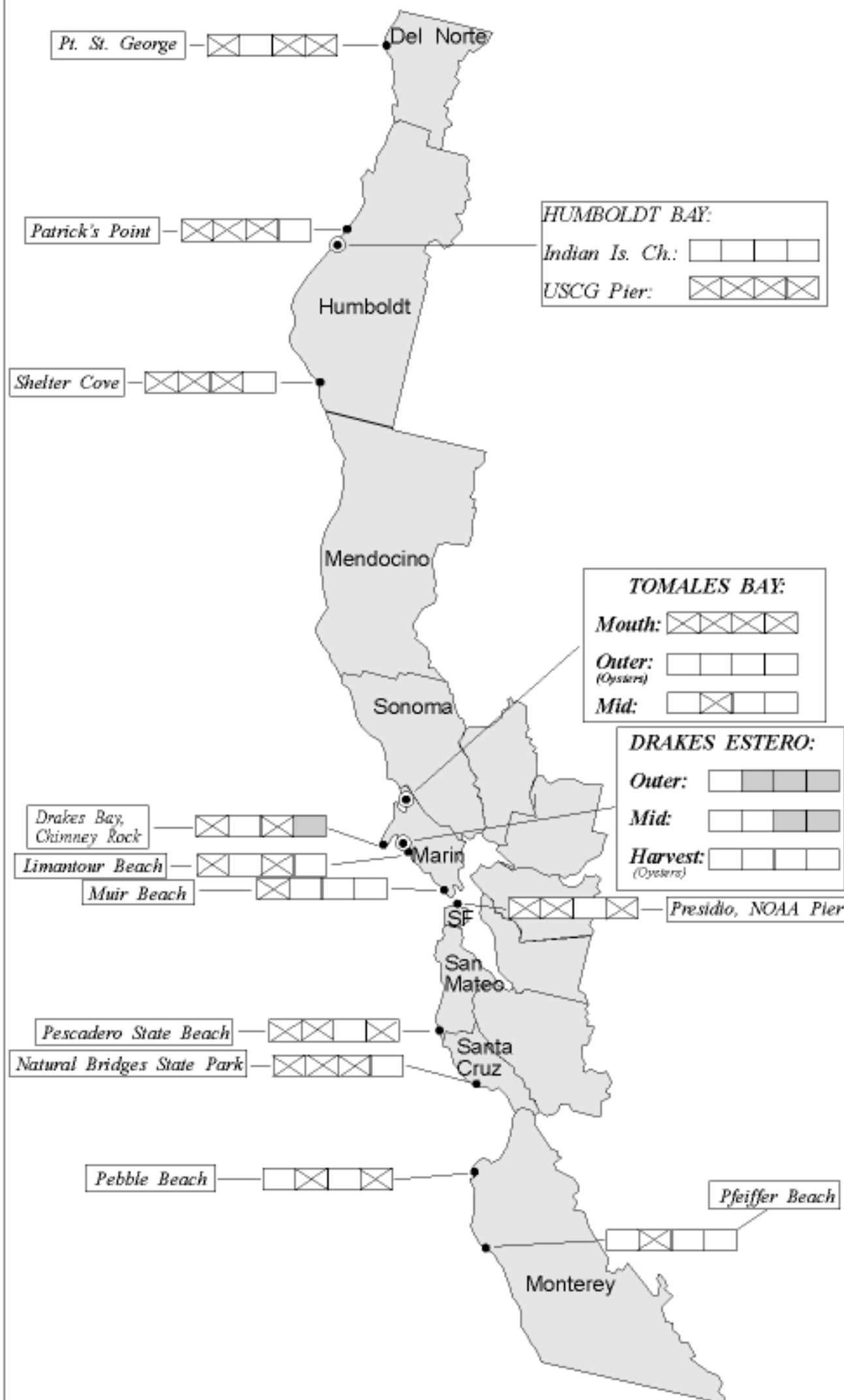
**Paralytic Shellfish Poisoning (PSP):** PSP toxicity was not detected in any samples collected during July.

*For Information on our Volunteer Field Sampling Program Please Call:*

**(510) 540-3423**

# Distribution of Shellfish Biotoxins

## Northern California



### Northern California Summary:

#### Paralytic Shellfish Poisoning (PSP):

PSP toxicity was detected in shellfish samples collected from various sites in Marin County in July. Low levels of toxins were detected in mussels collected at our sentinel station in outer Drakes Estero on July 13. By the third week of July PSP toxicity had reached farther inside the Estero. During the last week of July low levels of PSP toxins were detected at our sentinel station at Chimney Rock, as well as inside Drakes Estero.

*The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.*

*For More Information Please Call:  
(510) 540 - 3423*

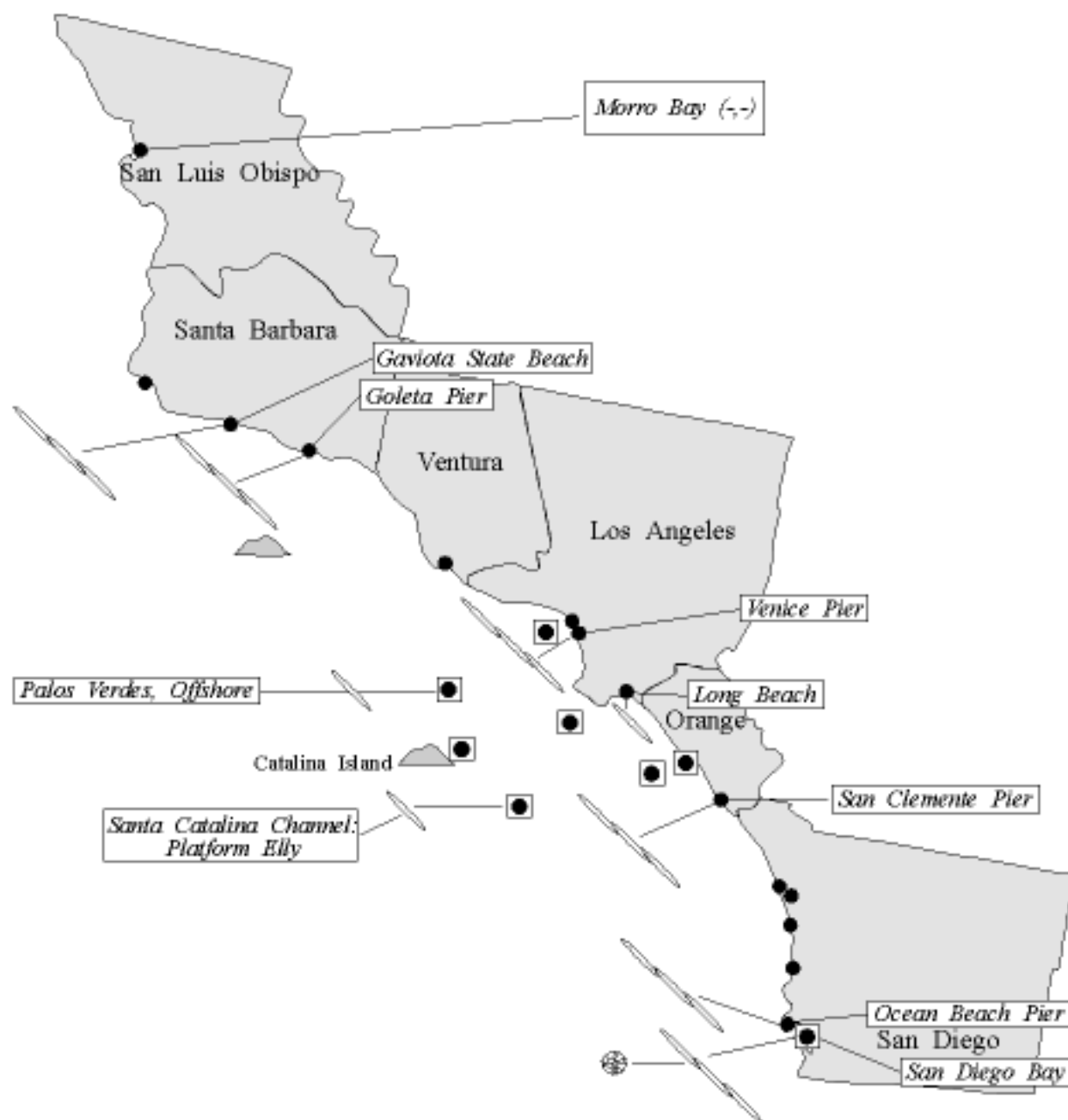
*For Recorded Biotoxin Information Call:  
(800) 553 - 4133*

# Phytoplankton Monthly Report

July 1999

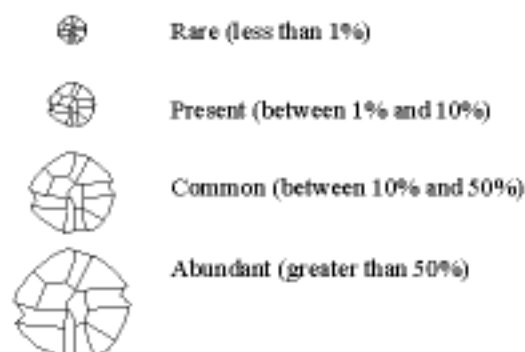
Technical Report No. 99-19

## Distribution of Toxin Producing Phytoplankton Southern California



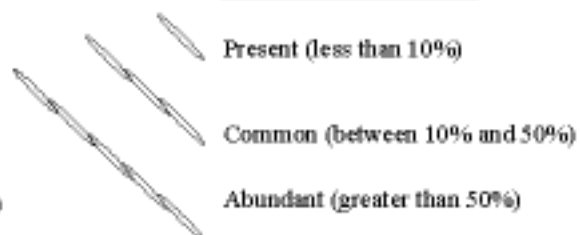
### Relative Abundance of Known Toxin Producers

#### Alexandrium Species



For areas with multiple sampling stations, species abundance at each station is represented as follows:  
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

#### Pseudo-nitzschia Species



#### MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- ⊙ Multiple Sampling Stations
- Offshore Sampling Station

### Southern California Summary:

*Alexandrium catenella* (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). Low numbers of *Alexandrium* were observed in a sample collected from San Diego Bay on July 4.

*Pseudo-nitzschia* species (includes all known potential domoic acid producing diatoms). The high relative abundances of *Pseudo-nitzschia* observed in recent months decreased dramatically along most of the Southern California coast. Despite the noticeable decrease in the distribution and abundance of *Pseudo-nitzschia*, this diatom was still common at sites in Santa Barbara, Los Angeles, and southern San Diego.

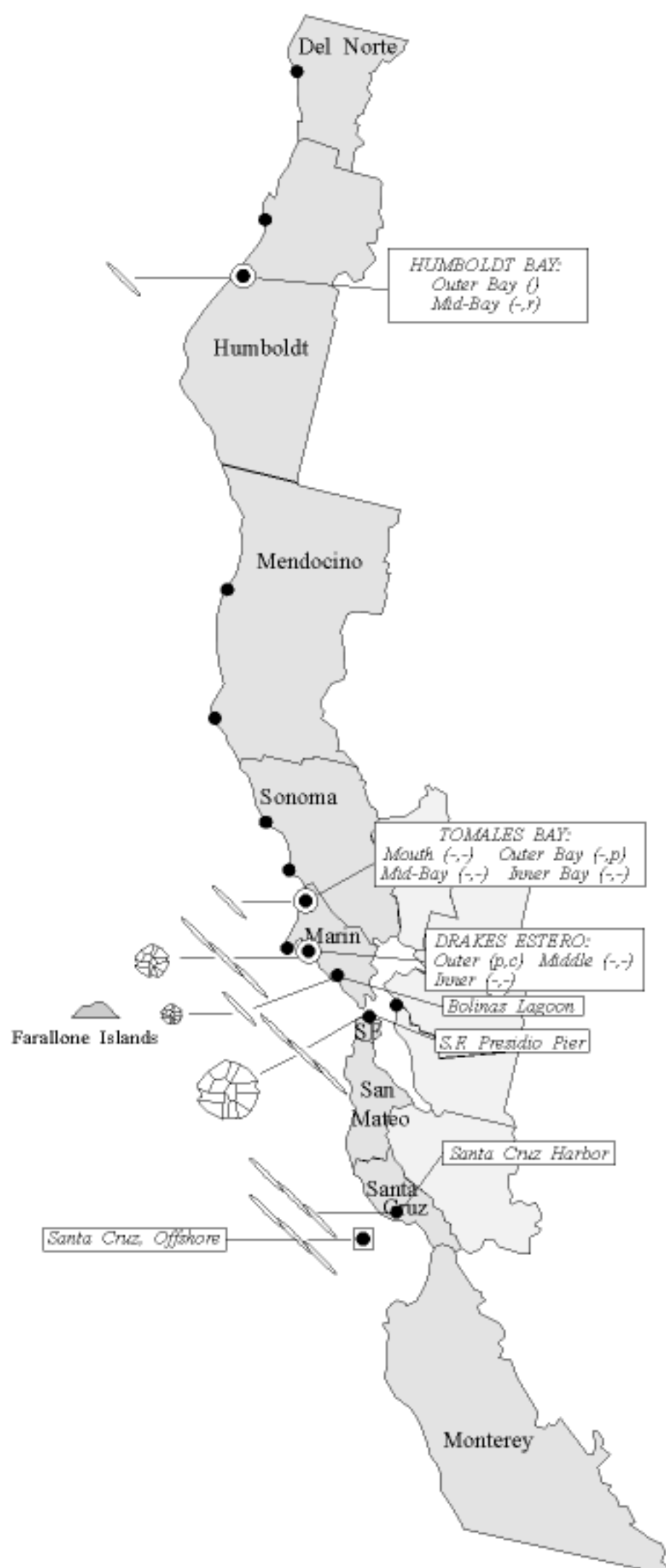
*The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.*

**For More Information Please Call:**  
**(510) 540-3423**

**For Recorded Biotxin Information Call:**  
**(800) 553-4133**

July 1999

## Distribution of Toxin Producing Phytoplankton Northern California



### Northern California Summary:

*Alexandrium catenella* (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* was observed at several Northern California sites during July. By the latter part of the month this dinoflagellate was detected inside the Golden Gate at the Presidio Pier (July 24), in Bolinas Lagoon (July 20), and inside Drakes Estero (July 22). The observation of *Alexandrium* inside Drakes Estero corresponded with the detection of low concentrations of PSP toxins in shellfish from this area.

*Pseudo-nitzschia* species (includes all known potential domoic acid producing diatoms). Low numbers of *Pseudo-nitzschia* were observed at several sites along the coast in July. The distribution and abundance of this diatom were similar to June's observations, with the highest numbers occurring between Santa Cruz and Marin counties and lower densities occurring farther north in Humboldt Bay.

*The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.*

*For More Information Please Call:  
(510) 540-3423*

*For Recorded Biotxin Information Call:  
(800) 553-4133*

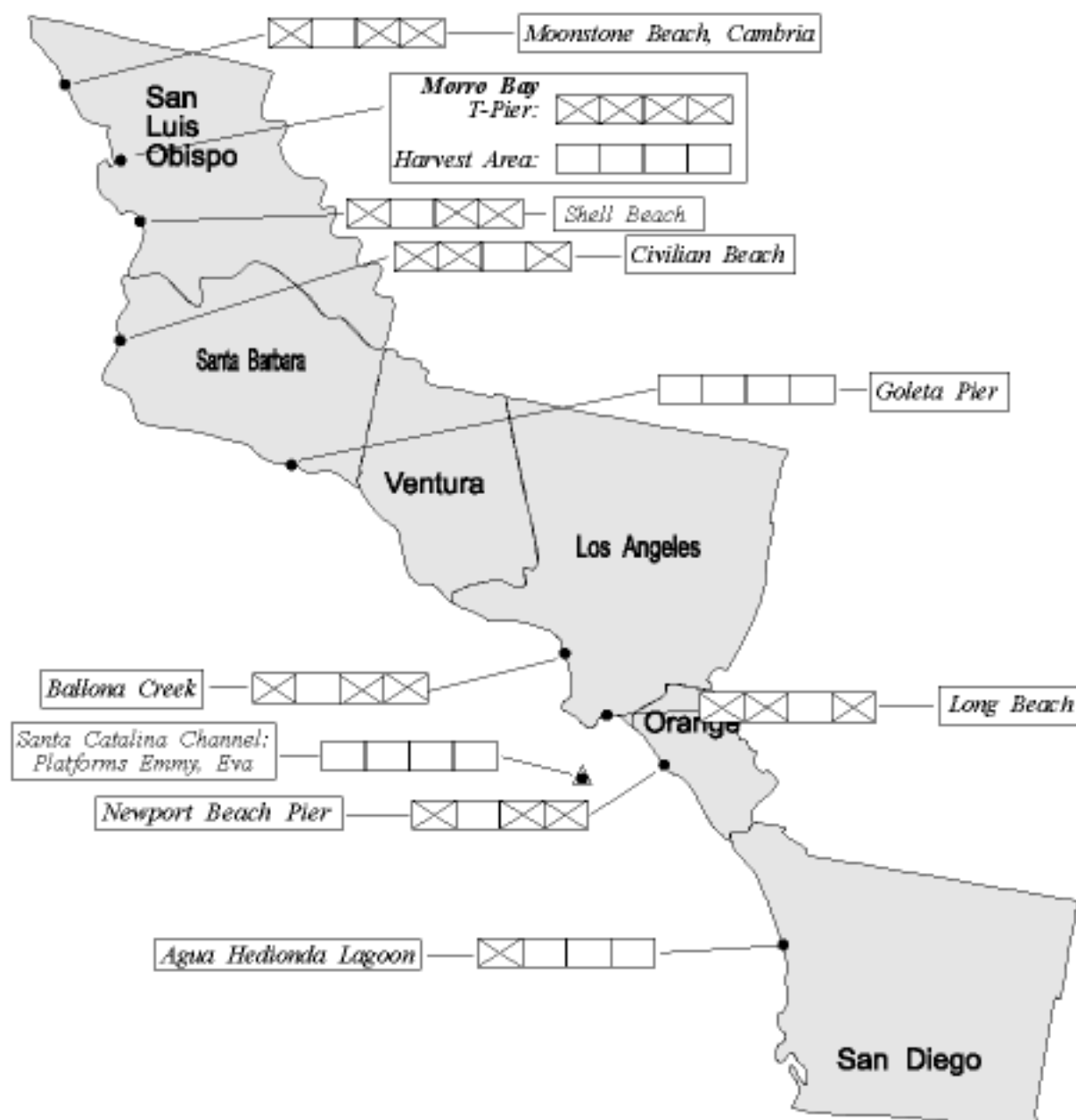
# SHELLFISH BIOTOXIN MONTHLY REPORT

August 1999

Technical Report No. 99-20

## Distribution of Shellfish Biotoxins

### Southern California



#### KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range:   
 (ug/100 g) no sample not detected < 80<sup>1</sup> ≥ 80

DA Range:   
 (ppm) no sample not detected < 20<sup>2</sup> ≥ 20

<sup>1</sup>PSP Alert Level <sup>2</sup>DA Alert Level   
 ● = Single Site ● = Multiple Sites ▲ = Offshore Site

Source: DHS Marine Biotoxin Monitoring and Control Program, August 1999.

## INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

### Southern California Summary:

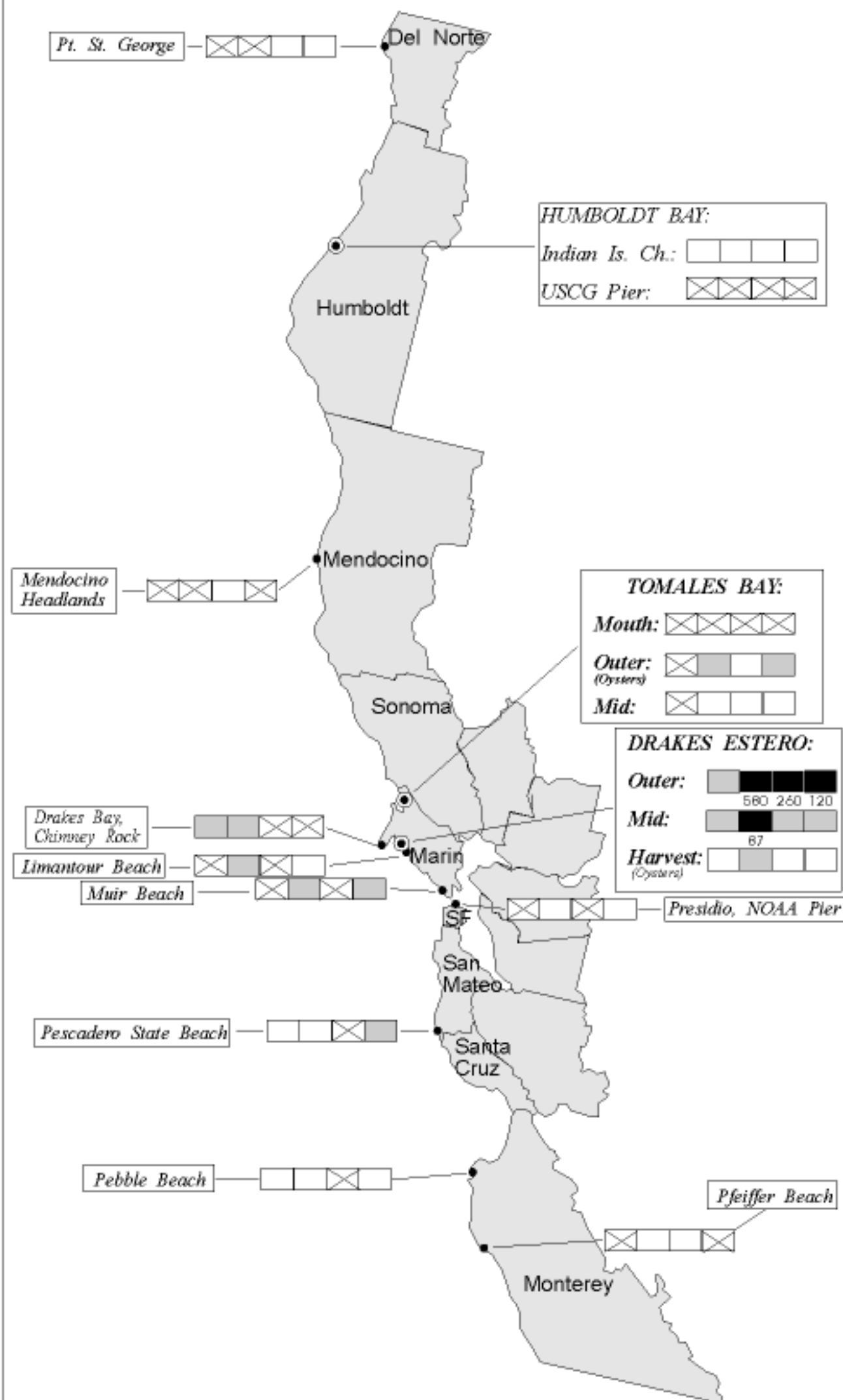
**Paralytic Shellfish Poisoning (PSP):** PSP toxicity was not detected in any samples collected during August.

*For Information on our Volunteer Field Sampling Program Please Call:*

**(510) 540-3423**

# Distribution of Shellfish Biotoxins

## Northern California



### Northern California Summary:

#### Paralytic Shellfish Poisoning (PSP):

PSP toxicity was detected in shellfish samples collected from various sites in Marin County and one site in San Mateo County during August. The distribution and magnitude of PSP toxicity in August was greater than observed in July.

Low level toxicity persisted in mussels collected along the Marin coast. By August 10 the toxin level had increased above the alert level (580 ug) at our sentinel station just inside Drakes Estero; by August 12 alert levels were also detected in the middle Estero (87 ug). PSP toxicity in mussels from Drakes Estero decreased throughout the rest of the month but remained above the alert level at the sentinel station.

*The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.*

*For More Information Please Call:  
(510) 540 - 3423*

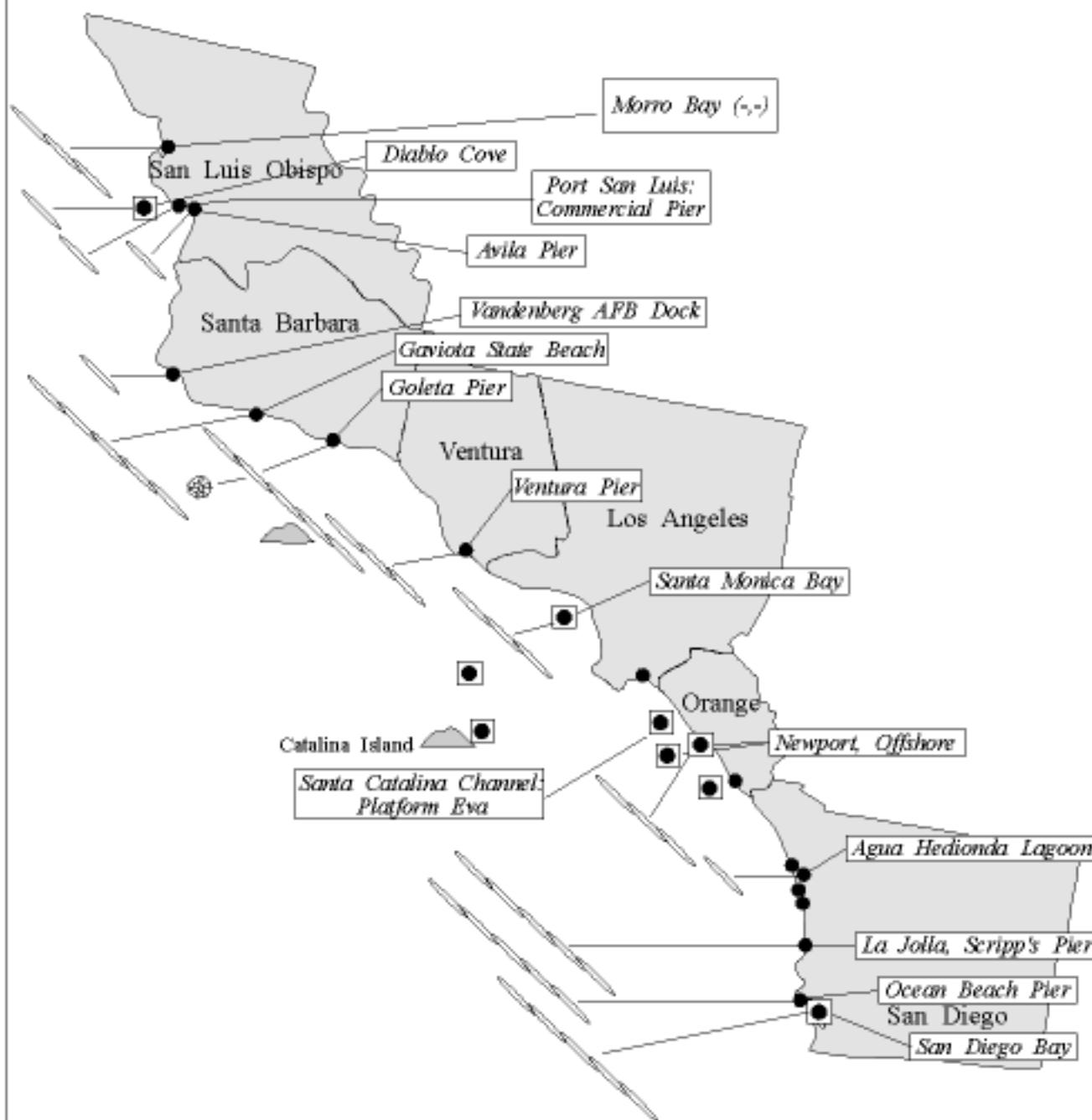
*For Recorded Biotoxin Information Call:  
(800) 553 - 4133*

# Phytoplankton Monthly Report

August 1999

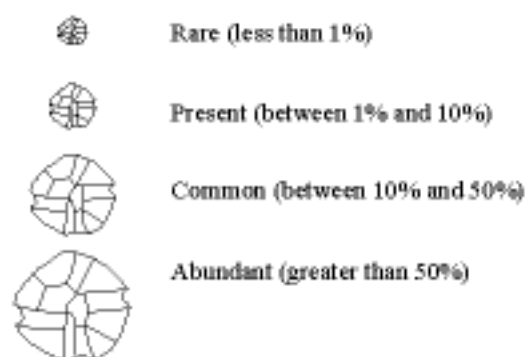
Technical Report No. 99-21

## Distribution of Toxin Producing Phytoplankton Southern California



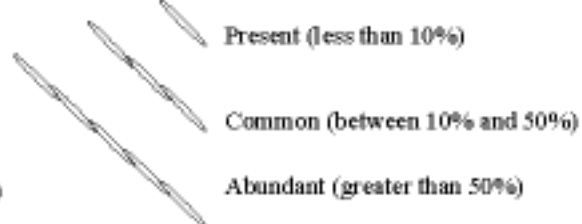
### Relative Abundance of Known Toxin Producers

#### Alexandrium Species



For areas with multiple sampling stations, species abundance at each station is represented as follows:  
(a.p) = Abundance for Alexandrium and Pseudo-nitzschia.  
e.g., (c.p) = common, present; (a,-) = abundant, not observed

#### Pseudo-nitzschia Species



#### MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- ⊙ Multiple Sampling Stations
- ◻ Offshore Sampling Station

### Southern California Summary:

*Alexandrium catenella* (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). Low numbers of *Alexandrium* were observed in a sample collected from Goleta Pier (Santa Barbara County) on August 18.

*Pseudo-nitzschia* species (includes all known potential domoic acid producing diatoms). Relative abundances of *Pseudo-nitzschia* increased along most of the Southern California coast. In Santa Barbara County this diatom was abundant at Goleta Pier (80%) on August 18 and at Gaviota Pier (58%) on August 29. Farther south along the San Diego coast high relative abundances of *Pseudo-nitzschia* were observed at Ocean Beach Pier (75%) on August 2, and at Scripps Pier (75%) and inside San Diego Bay (60%) on August 18 and 15, respectively.

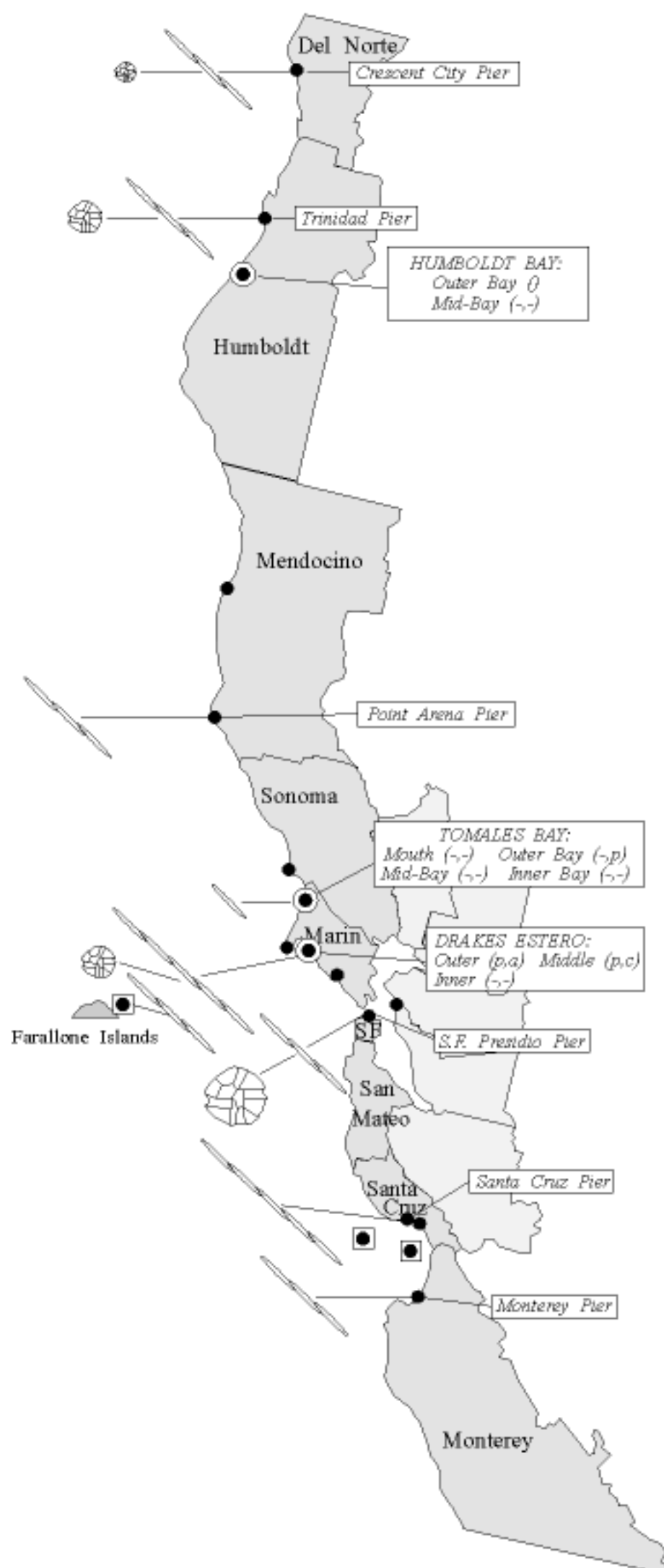
*The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.*

*For More Information Please Call:  
(510) 540-3423*

*For Recorded Biotxin Information Call:  
(800) 553-4133*



## Distribution of Toxin Producing Phytoplankton Northern California



### Northern California Summary:

*Alexandrium catenella* (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* was observed at several Northern California sites during August. The distribution and abundance of *Alexandrium* along the Marin coast and inside the Golden Gate were very similar to July's observations. Low numbers of this dinoflagellate were detected at the Crescent City Pier (Del Norte County), and slightly higher numbers were observed at Trinidad Pier (Humboldt County), on August 19.

Low to moderate numbers of *Alexandrium* were observed inside Drakes Estero (Marin County) throughout the month and were associated with moderate concentrations of PSP toxins in shellfish from this area. The highest relative abundance of *Alexandrium* (14%) was observed just inside the Golden Gate (San Francisco) on August 13.

*Pseudo-nitzschia species* (includes all known potential domoic acid producing diatoms). The distribution and abundance of this diatom were similar to July's observations, with the highest relative abundances occurring between Santa Cruz and Marin counties and lower densities occurring farther north in Humboldt and Del Norte counties. The relative abundances observed in Santa Cruz and Marin represent an increase from their numbers in July.

*The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.*

*For More Information Please Call:  
(510) 540-3423*

*For Recorded Biotxin Information Call:  
(800) 553-4133*

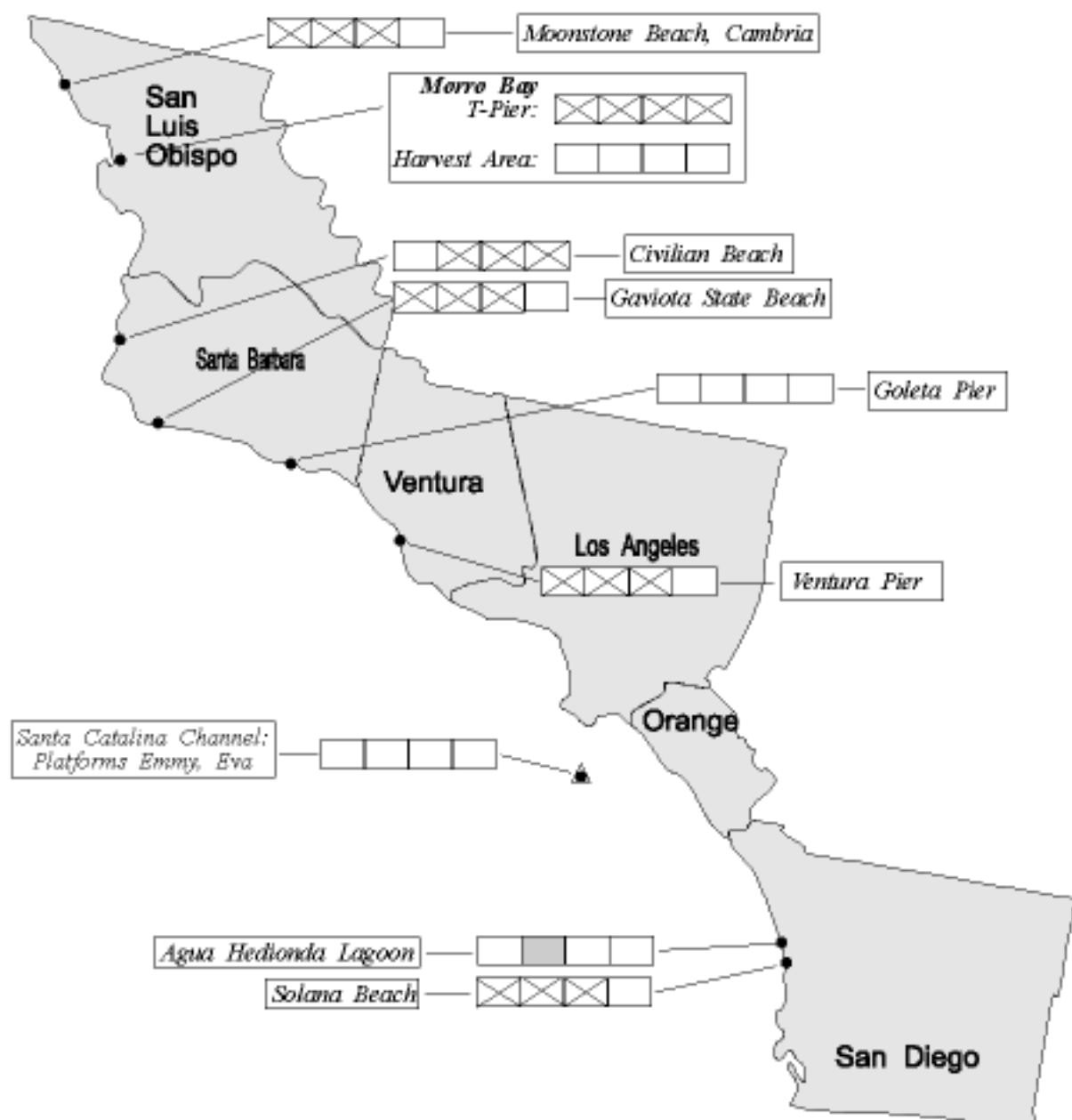
# SHELLFISH BIOTOXIN MONTHLY REPORT

September 1999

Technical Report No. 99-22

## Distribution of Shellfish Biotoxins

### Southern California



#### KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range:   
 (µg/100 g)   
 no sample not detected < 80<sup>1</sup> ≥ 80

DA Range:   
 (ppm)   
 no sample not detected < 20<sup>2</sup> ≥ 20

<sup>1</sup>PSP Alert Level <sup>2</sup>DA Alert Level   
 ● = Single Site ● = Multiple Sites ▲ = Offshore Site

Source: DHS Marine Biotoxin Monitoring and Control Program, September 1999.

## INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

### Southern California Summary:

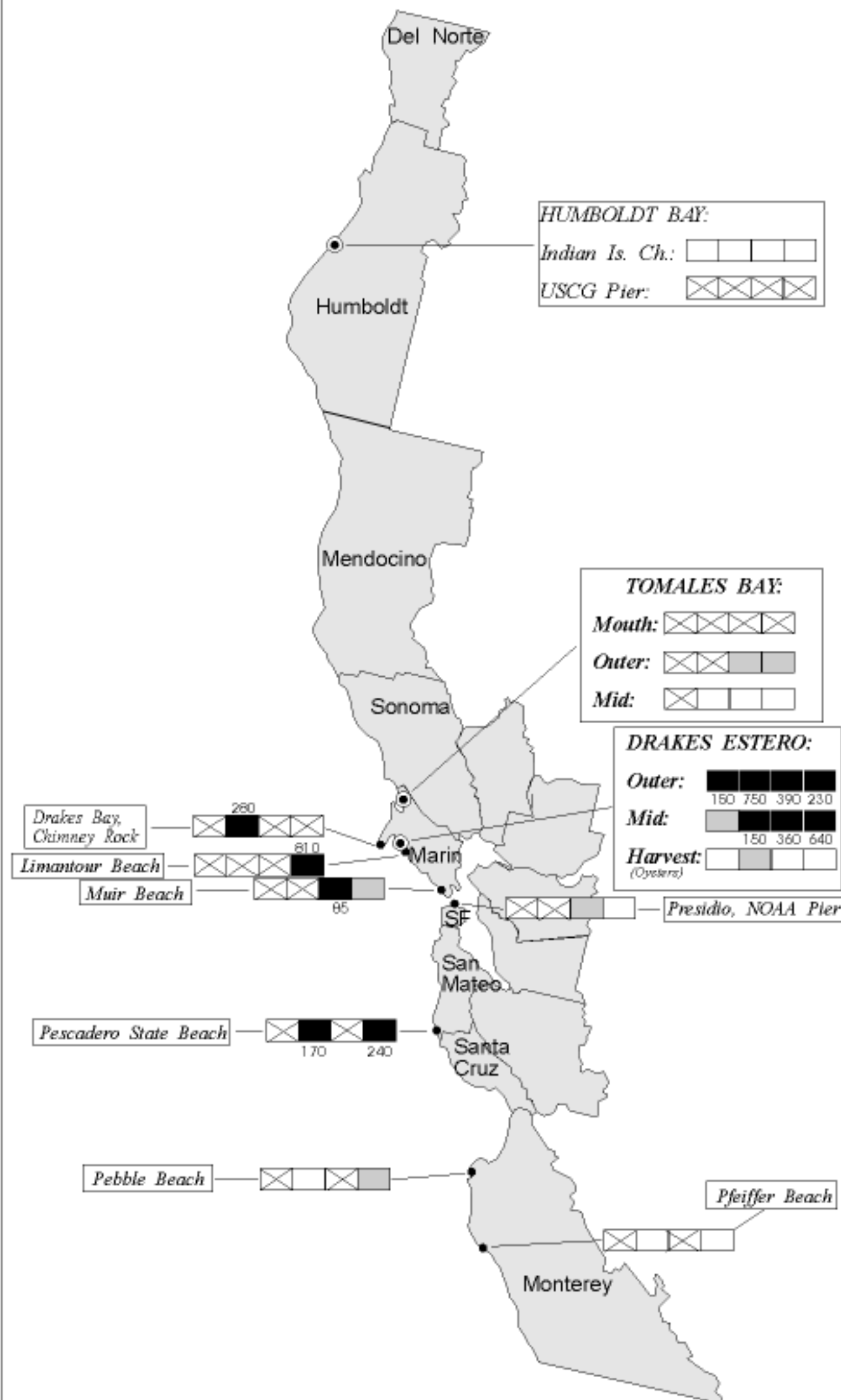
**Paralytic Shellfish Poisoning (PSP):** PSP toxicity was detected at one site during September. Mussels from Agua Hedionda Lagoon (San Diego County) contained 79 µg of toxins on September 13. Subsequent samples did not contain detectable levels of toxins.

*For Information on our Volunteer Field Sampling Program Please Call:*

**(510) 540-3423**

# Distribution of Shellfish Biotoxins

## Northern California



### Northern California Summary:

#### Paralytic Shellfish Poisoning (PSP):

The PSP toxicity observed along the Marin and San Mateo coasts in August increased through September. Low levels of toxicity were also detected inside the Golden Gate and farther south along the Monterey coast. The distribution and magnitude of PSP toxicity in September was greater than observed in July and August.

The highest toxin levels were observed in the Drakes Bay region of Marin County. By September 14 PSP toxicity had increased to 280 ug at the Chimney Rock sentinel station. Mussels from Limantour Beach just south of the entrance to Drakes Estero contained 810 ug of PSP toxins (September 28).

The alert levels of toxicity detected inside Drakes Estero in August increased by mid-September. Mussels from our sentinel station just inside Drakes Estero reached 750 ug on September 12 and decreased to 230 ug by September 28. In contrast, mussels from the mid-Estero continued to increase throughout the month, reaching 640 ug by September 28.

Low levels of PSP toxicity were also detected in mussels and oysters from the outer portion of Tomales Bay by the end of the month.

Samples were not submitted from Sonoma or Mendocino counties, therefore the northern extent of this event could not be determined.

*The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.*

*For More Information Please Call:  
(510) 540-3423*

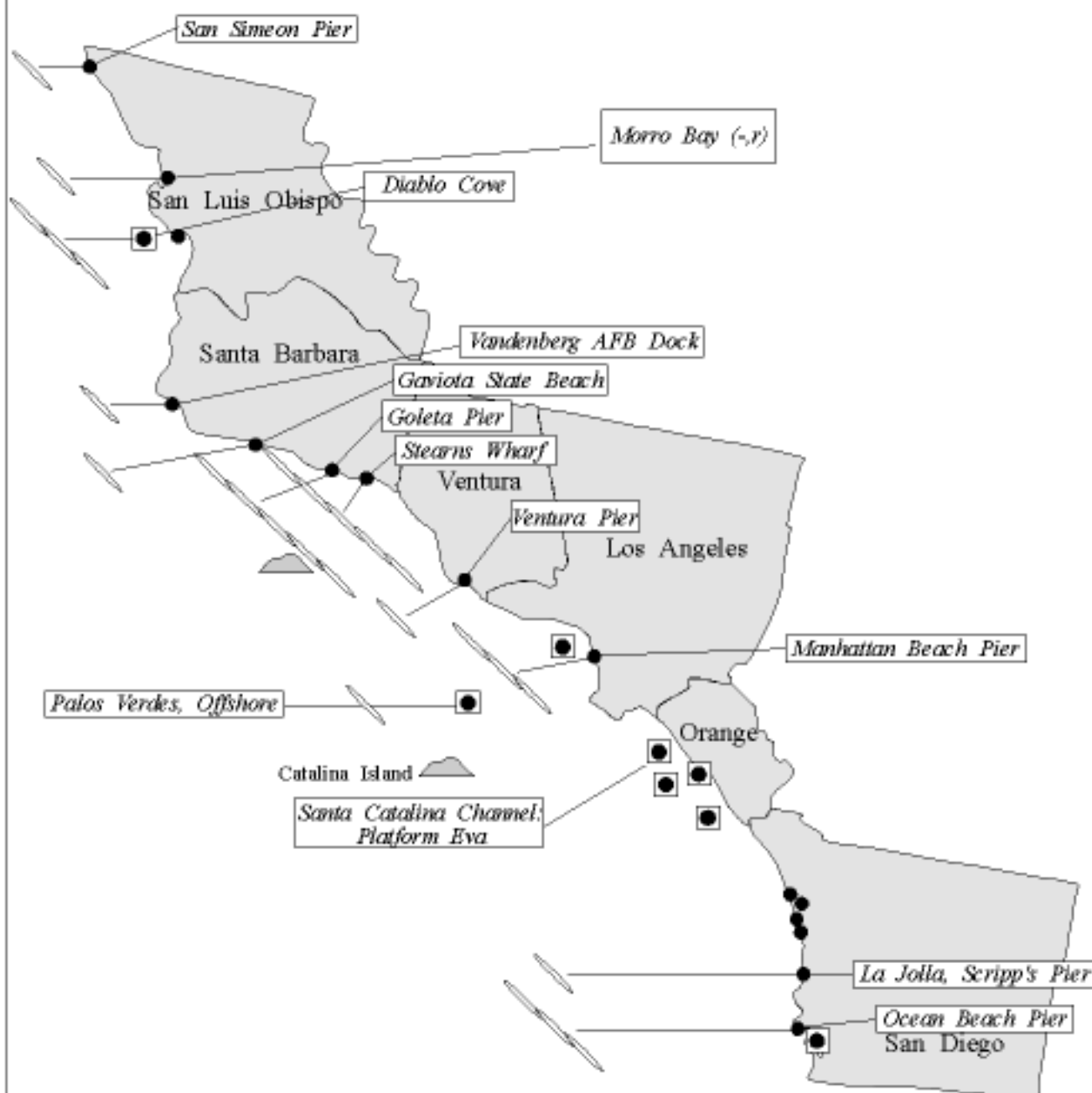
*For Recorded Biotoxin Information Call:  
(800) 553-4133*

# Phytoplankton Monthly Report

September 1999

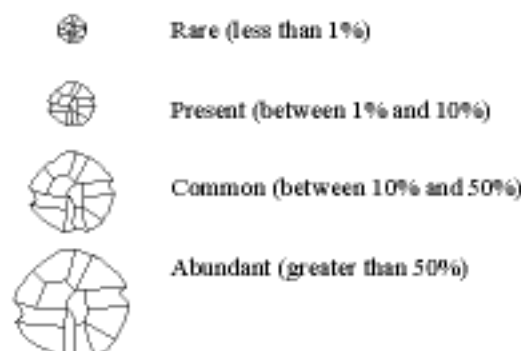
Technical Report No. 99-23

## Distribution of Toxin Producing Phytoplankton Southern California



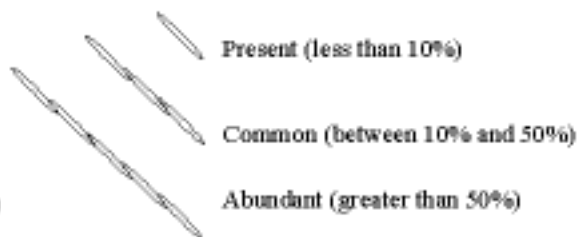
### Relative Abundance of Known Toxin Producers

#### Alexandrium Species



For areas with multiple sampling stations, species abundance at each station is represented as follows:  
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

#### Pseudo-nitzschia Species



#### MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- ⊙ Multiple Sampling Stations
- Offshore Sampling Station

### Southern California Summary:

*Alexandrium catenella* (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* was not observed at any sites during September.

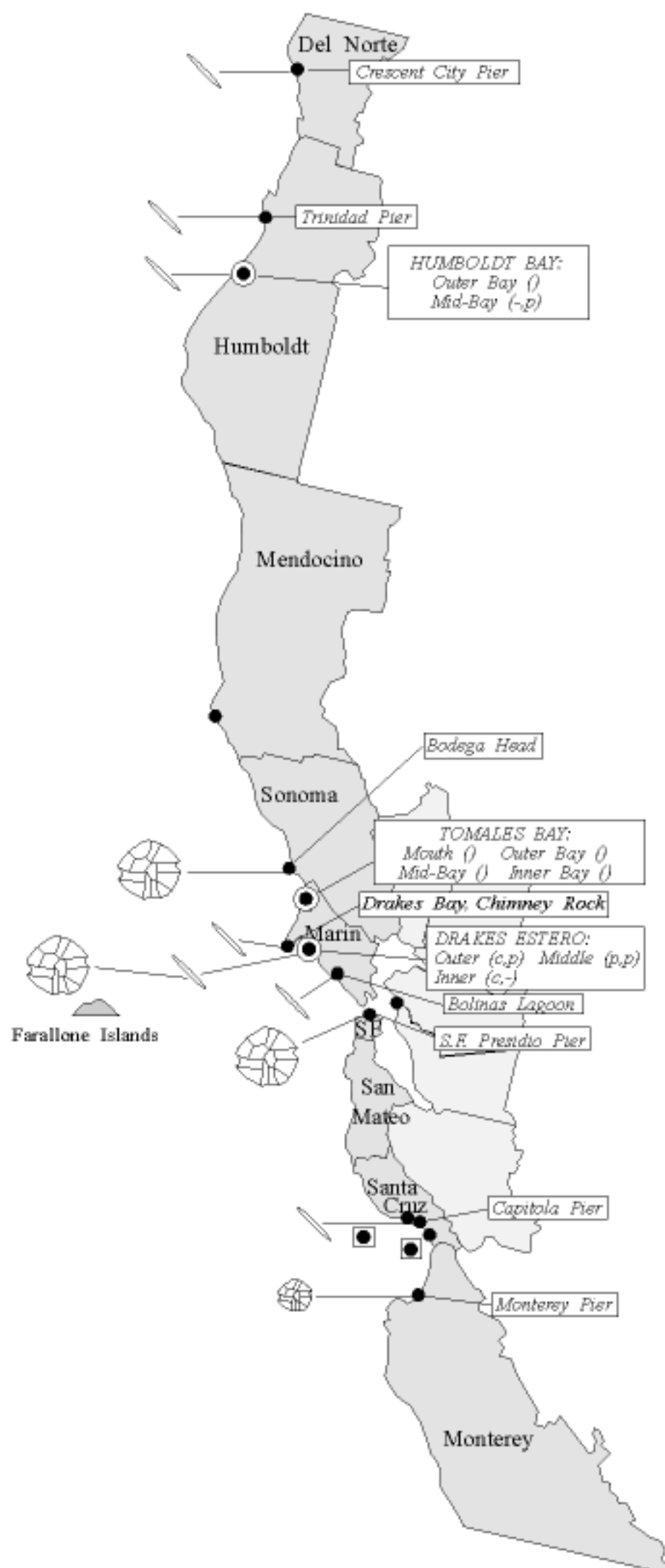
*Pseudo-nitzschia* species (includes all known potential domoic acid producing diatoms). Relative abundances of *Pseudo-nitzschia* decreased along most of the Southern California coast from August into September. This diatom was initially abundant at two locations in Santa Barbara County during the first few days of September, but these numbers decreased over the following two weeks. Farther south along the San Diego coast the high relative abundances of *Pseudo-nitzschia* observed in August were greatly reduced throughout September.

*The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.*

*For More Information Please Call:  
(510) 540-3423*

*For Recorded Biotxin Information Call:  
(800) 553-4133*

## Distribution of Toxin Producing Phytoplankton Northern California



### Northern California Summary:

*Alexandrium catenella* (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* was observed at several Northern California sites during September. It appeared that the distribution and abundance of *Alexandrium* expanded moderately during September. This dinoflagellate was observed for the first time in several months at Bodega Head (Sonoma County) and in southern Monterey Bay.

The abundance of *Alexandrium* inside Drakes Estero (Marin County) increased noticeably and was linked with increased PSP toxicity in mussels from this area at the time. The high relative abundance of *Alexandrium* observed inside the Golden Gate during July and August persisted through September, however the cell densities were lower than observed in Drakes Estero.

*Pseudo-nitzschia* species (includes all known potential domoic acid producing diatoms). The distribution of this diatom was similar to September's observations, however the relative abundances were greatly reduced from the previous month.

*The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.*

*For More Information Please Call:  
(510) 540 - 3423*

*For Recorded Biotoxin Information Call:  
(800) 553 - 4133*